
Comments Received from the Aluminum Association

February 25, 1999

Mr. Frank Anscombe
USEPA (G-17J),
77 W. Jackson Blvd.,
Chicago, IL 60604

Dear Mr. Anscombe:

This letter is in response to our review of the aluminum production related sections of the EPA draft report *Great Lakes Binational Toxics Strategy Octachlorostyrene (OCS) Report: A Review of Potential Sources* prepared by Battelle Memorial Institute (December 22, 1998). Our comments on the draft report address the discussion of octachlorostyrene emissions formation potential from primary and secondary aluminum processes and follow in the order of appearance in the draft report.

1 Aluminum Degassing (section 4.8)

The draft report outlines OCS formation from the use of hexachloroethane (HCE) fluxing agents in secondary aluminum operations to recover reclaimed aluminum. The report is correct in attributing potential OCS formation with HCE flux usage. The attached table (1) outlines the use of HCE fluxing agents in the US for the secondary aluminum production industry. To address the potential for OCS emissions in the secondary aluminum industry, we have reviewed data gathered during the development process for secondary aluminum Maximum Achievable Control Technology (MACT) standards. EPA gathered data for the secondary aluminum MACT under a Clean Air Act section 114 Information Collection Request (ICR), receiving input for 686 furnaces in the US. The data indicate that the use of HCE as a secondary aluminum fluxing agent is very rare in this country. Of 686 furnaces included in the ICR data base, only 13 small secondary aluminum furnaces report using HCE as a fluxing agent. No large secondary aluminum operations use HCE as a fluxing agent in the US, and none of the reported furnaces were in facilities that are members of the Aluminum Association. As a result, the potential for OCS emissions as a result of HCE flux usage in secondary operations is very low, and is essentially zero in the US for our Association members.

Table 1

Hexachloroethane Usage in the US Secondary Aluminum Production Industry

Location	ICR Furnace #	Furnace Type	Aluminum Production (TPY)	Controls
Gnadenhutten, OH	132	holding	18,000	baghouse with lime
Ft. Wayne, IN	404	melting	125	none
Ft. Wayne, IN	405	melting	125	none
Ft. Wayne, IN	406	melting	125	none
Ft. Wayne, IN	407	melting	125	none
Ft. Wayne, IN	408	melting	125	none
Ft. Wayne, IN	409	melting	125	none
Ft. Wayne, IN	198	melting	947	none
Ft. Wayne, IN	199	melting	125	none
Los Angeles, CA	280	holding	17,100	none
Haytl, MO	140	melting	10,000	none
Bryan, TX	129	reverb	3,500	baghouse
Bryan, TX	130	reverb	3,500	baghouse
Total Production			53,922	

Source: USEPA Secondary Aluminum Production Maximum Achievable Control Technology (MACT) Information Collection Request (ICR), 1992/1993.

EPA should also be aware that the data in Table 1 is at least five years old. There has been a generally recognized trend to move away from HCE flux usage in secondary aluminum in the US and abroad. Therefore, the table may represent historical HCE usage levels no longer occurring in the industry.

2 Concerning the formation of OCS from other operations in secondary aluminum, there has been no reported connection that the formation of OCS occurs using other fluxing agents including chlorine without the addition of HCE.

3 A statement at the end of section 4.8 on aluminum degassing is in error. The statement reads:

A[T]he use of argon gas in the degassing of aluminum smelts apparently suffices as a substitute for chlorine or chlorinated degassing agents, without the undesirable generation of chlorinated organic compounds.@

This statement is not factual since many products and charge materials developed and utilized in secondary aluminum cannot be processed satisfactorily without the use of chlorine fluxing agents to remove impurities and/or gas bubbles. The use of argon gas as a chlorine substitute is occurring in the industry where possible. However, chlorine is still a necessary fluxing agent for a number of process/product operations. The statement noted above should be deleted from the report.

4 Secondary Aluminum Smelting (section 4.0)

This section, which is somewhat redundant to the section on aluminum degassing, suggests that OCS is formed from the use of chlorine or sodium chloride and fluoride salts. This assertion is hypothetical, and we believe not a viable possibility in secondary aluminum processing. The fluxing agents used in secondary aluminum processing, besides HCE, do not contain the highly chlorinated alkanes or alkenes necessary to facilitate OCS formation. In secondary processing the charged metal is preconditioned or heated during melting to remove coatings and organics before fluxing. Organic materials present on the charged material is driven off prior to the introduction of fluxing agents. Subsequent use of chlorine, salts and other fluxing agents that do not contain the requisite chlorinated alkanes or alkenes will not promote the formation of OCS. Only HCE fluxing agents have that potential, as discussed above in these comments.

5 Primary Aluminum (section 4.20)

The draft report outlines the potential for OCS formation from the AAlcoa Smelting Process® which utilizes aluminum chloride in an electrolytic process. This process is not in use in the US at any facility that we are aware of, including all Aluminum Association members. All primary aluminum facilities utilize the following process:

Primary aluminum is produced using the Hall-Heroult electrolytic process. In this process, aluminum production is carried out in a semi-batch manner in large electrolytic cells called pots with a dc input of up to 280,000 amperes and about 5 volts. The pot is a rectangular steel shell typically 30 to 50 feet long, and 9 to 12 feet wide, and 3 to 4 feet high, and is lined with a refractory insulating shell on which carbon blocks are placed to form a cathode. Steel collector bars are inserted into the cathode blocks to carry current away from the pot. Molten cryolite (sodium-aluminum fluoride) is placed in the cavity formed by the cathode blocks. Anodes, also of baked carbon, are immersed in the cryolite to complete the electrical path. Anodes may be either pre-baked in a separate process and attached to connecting rods for immersion into the bath (termed Prebake design cells), or may be formed through self-baking from coal-tar

and petroleum coke paste that is fed into the top of a steel casing above the cell (termed Soderberg design cells). Alumina (Al₂O₃) is fed in powder form into the pots by various design means and is dissolved in the cryolite bath.

The potential for OCS from primary aluminum production using the Hall-Heroult process is essentially zero since there is no source of chlorine.

The section on Primary Aluminum in the report further describes an additional process to purify aluminum subsequent to production, through a three layered electrolytic process. This process is not in operation in the US to our knowledge based on information available from our membership. Therefore, the potential for OCS formation from the purification process outlined in the draft report is likely to be zero in the US.

Potential Sources of OCS (section 4.3, Table 2)

6 Table 2 in the draft report that outlines potential sources of OCS needs to be revised to reflect the comments included in this submission. Specifically, the ~~documented~~ section of sources includes a secondary aluminum smelting reference that reads: ~~Vaporization of chlorinated organic coatings in used beverage containers; use of chlorine in demagging.~~ This statement should be revised read: **Removal of contaminants with the addition of hexachloroethane fluxing agents.** There are no other documented OCS sources in secondary aluminum. Similarly, the section in Table 2 on Primary Aluminum that refers to ~~Electrolytic purification or manufacture of aluminum using a chloride salt and graphite electrodes~~ should be removed. The electrolytic purification process noted in the table is not in use in the US to our knowledge and is therefore not a possible source for OCS.

Potential National OCS Emissions by Source Category (Section 4.24, Table 4)

7 Included in Table 4 is an estimate of OCS emissions from secondary aluminum smelting totaling over 11,000 grams per year. This estimate needs to be revised significantly to reflect the much smaller use of HCE fluxing agents outlined in this submission.

We hope that this information is useful in your efforts to revise the draft OCE report. Please contact my office (202/862-5132) if I can be of further assistance.

Sincerely yours,

Robert P. Strieter
Director, Environmental Affairs

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